



Fact Sheet

NPDES Permit Number: AKG-37-1000

Date: January 14, 2000

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The U.S. Environmental Protection Agency (EPA) Plans To Issue A General Wastewater Discharge Permit To:

Alaskan Suction Dredge Miners

and

This will also serve as a
Notice to Revoke coverage under the Modified 1994 GP,

NOTICE OF STATE CERTIFICATION,

and

provide information on
DETERMINATION OF CONSISTENCY
WITH THE
ALASKA COASTAL MANAGEMENT PROGRAM

EPA Proposes NPDES Permit Issuance.

EPA proposes to issue a National Pollutant Discharge Elimination System (NPDES) General Permit to Alaskan Suction Dredge Miners for gold placer mining operations in Alaska. The proposed permit sets conditions on the discharge - or release - of pollutants from the operation into waters of the United States. EPA proposes that the general permit become effective some time after the 2000 mining season and that the revocation of coverage under the modified 1994 GP occur at the same time.

This Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures

- S a description of the industry
- S a description of proposed effluent limitations , monitoring requirements, and other conditions

The State of Alaska certification.

EPA has requested that the Alaska Department of Environmental Conservation (ADEC) certify the NPDES permit for this operation under section 401 of the Clean Water Act (CWA).

Consistency Determination

The State of Alaska, Office of Management and Budget, Division of Governmental Coordination (DGC), intends to review this action for consistency with the approved Alaska Coastal Management Program (ACMP). For more information concerning this review, please contact Mr. Rex Blazer at (907) 465-8791.

EPA invites comments on the proposed permit.

EPA will consider all substantive comments before issuing a final permit. Those wishing to comment on the proposed permit may do so in writing by March 14, 2000. EPA has scheduled public hearings in Anchorage and Fairbanks. The Anchorage hearing will be from 6pm to 9pm on February 29, 2000, at the Days Inn Conference Center, 330 E. 4th Avenue. The Fairbanks hearing will be from 6pm to 9pm on March 7, 2000, at the Carlson Center, 2010 Second Avenue, Pioneer Room. A sign-in process will be used for persons wishing to make a statement or submit written comments at the hearing.

Persons wishing to comment on State Certification should submit written comments by the public notice expiration date to the Alaska Department of Environmental Conservation, 610 University Avenue, Fairbanks, Alaska 99709.

For more information on the ACMP consistency review process and the comment deadline, or to submit comments, please contact Mr. Rex Blazer at DGC, P.O. Box 110030, Juneau, AK, 99811-0030 or at (907) 465-8791.

The general permit (GP) will become effective 30 days after publication of the final GP in the Federal Register according to Section 553(d) of the APA.

Documents are available for review.

The proposed NPDES permit and fact sheet can be reviewed at EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday. This material is also available for inspection and copying at the following places in Alaska:

USEPA Alaska Operations Office
Federal Building, Room 537
222 West 7th Avenue
Anchorage, Alaska 99513-7588
Telephone: (800) 781-0983 (Within Alaska)

USEPA Alaska Operations Office
410 Willoughby Avenue, Suite 100
Juneau, Alaska 99801
Telephone: (907) 586-7619

ADEC Watershed Development Program
Air and Water Quality Division
610 University Avenue
Fairbanks, AK 99709
Telephone: (907) 451-2101

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I. GENERAL PERMITS

A. Permit Coverage

1. Section 301(a) of the CWA provides that the discharge of pollutants is unlawful except in accordance with a National Pollutant Discharge Elimination System (NPDES) permit. Although such permits are usually issued to individual dischargers, EPA's regulations also authorize the issuance of "general permits" to categories of discharges [40 CFR 122.28] when a number of point sources are:
 - a. Located within the same geographic area and warrant similar pollution control measures;
 - b. Involve the same or substantially similar types of operations;
 - c. Discharge the same types of wastes;
 - d. Require the same effluent limitations or operating conditions;
 - e. Require the same or similar monitoring requirements; and
 - f. In the opinion of the Director, are more appropriately controlled under a general permit than under individual permits.
2. Like individual permits, a violation of a condition contained in a general permit constitutes a violation of the Act and subjects the owner or operator of the permitted facility to the penalties specified in Section 309 of the Act.
3. A Notice of Intent (NOI) to be covered under this General Permit is required [40 CFR 122.28(b)(2)(i)]. The requirements are outlined in Part I.F. of the permit.
4. This permit will expire five (5) years from the date of effective date. 40 CFR 122.28(b)(1) allows a general permit to be administered according to the individual permit regulations found in 40 CFR 124 so the general permit will continue in force and effect until a new general permit is issued. Only those facilities authorized to discharge under the expiring general permit that submit an NOI 90 days prior to the expiration of this general permit are covered by the continued permit.
5. EPA is proposing that all facilities covered by the 1994 general permit retain coverage under this general permit.

B. Limitations on Coverage

1. Many streams and stream reaches in Alaska have been designated as part of the federal wild and scenic rivers system or as a Conservation System Unit (CSU). Because this permit does not relieve a permittee of the requirements of other applicable federal, state or local laws, permittees should contact the district offices of the agencies that administer these systems for additional restrictions that may apply to operations on claims within these designated areas.
2. Many streams in Alaska where suction dredging occurs have been designated by Alaska Department of Fish and Game as needing a permit with additional restrictions. Because this permit does not relieve a permittee of the requirements of other applicable federal, state or local laws, the proposed permit requires permittees to contact the Alaska Department of Fish and Game.

C. Prohibitions

1. This general permit does not apply to facilities that are proposed to be located in National Parks System Units (i.e., Parks and Preserves), National Monuments, Sanctuaries, Wildlife Refuges, Conservation Areas, Wilderness Areas, Critical Habitat Areas, or waters adjacent to the boundaries of areas designated as wild under the Wild & Scenic Rivers Act.
2. This permit does not apply to wetlands designated in the 1995 Anchorage Wetlands Management Plan.

D. Individual Permits

1. Owners or operators covered by a general permit may be excepted from coverage by applying to the Director of the NPDES program for an individual permit. This request must be made by submitting an NPDES permit application, together with supporting documentation within 90 days of publication by EPA of the final general permit in the Federal Register, or 180 days prior to the commencement of operation of a new source or new discharger.
2. The Director may require any person authorized by a general permit to apply for and obtain an individual permit, or any interested person may petition the Director to take this action. The Director may consider the issuance of an individual permit when:
 - a. The single discharge or the cumulative number of discharges is/are a significant contributor of pollution;

- b. The discharger is not in compliance with the terms and conditions of the general permit;
- c. A change has occurred in the availability of demonstrated technology or practices for the control or abatement of pollutants applicable to the point source;
- d. Effluent limitations guidelines are subsequently promulgated for the point sources covered by the general permit;
- e. A Water Quality Management Plan containing requirements applicable to such point sources is approved.
- f. Circumstances have changed since the time of the request to be covered so that the discharger is no longer appropriately controlled under the general permit, or either a temporary or permanent reduction or elimination of the authorized discharge is necessary

II. BACKGROUND ON SUCTION DREDGE PERMITTING

On June 30, 1992, EPA received a notice of citizen suit, that alleged that EPA failed to perform a non-discretionary duty to regulate suction dredge gold placer mining operations in Alaska. At that time, EPA decided it would issue individual permits for mechanical placer mining operations (for the 1993 mining season) and propose a general permit for suction dredge operations. On January 14, 1994, EPA proposed a general permit that extended coverage to mechanical as well as suction dredge operations. 59 FR 2504 (Jan. 14, 1994). After responding to public comment, EPA issued the final general permit on May 13, 1994. 59 FR 28079 (May 31, 1994). On September 28, 1994, two environmental groups filed a petition for review of the general permit in the Ninth Circuit Court of Appeals.

On November 18, 1996, EPA and the two environmental groups entered into a settlement agreement to resolve the challenge to the general permit. Pursuant to the agreement, EPA agreed to issue three separate general permits to modify and supersede the original general permit challenged by the environmental groups in 1994. The settlement agreement also required EPA to complete two studies related to the impact of placer mining on the natural environment in Alaska. One study was to address the discharge of metals by placer mining operations and the other was to address the impact of suction dredge mining.

EPA issued three modified general permits on December 6, 1996, one for mechanical operations, one for medium-size suction dredge operations, and one for small suction dredges [61 FR 64796, December 6, 1996]. On April 4, 1997, three environmental groups challenged these permits. No. 97-70365 (9th Cir). In

a separate action, the Alaska Miners Association (AMA) also challenged the general permits. No. 97-70379 (9th Cir.). These cases were consolidated on May 5, 1997. The challenge by the AMA was dismissed on January 21, 1999.

During the summers of 1997 and 1998 EPA staff and EPA contractors collected data at 31 placer mine sites and several suction dredge sites. These data were analyzed and presented in two final reports, one entitled "Alaska Placer Mining Metals Study" and the other entitled "Impact of suction dredging on water quality, benthic habitat, and biota in the Fortymile River, Resurrection Creek, and Chatanika River, Alaska." The environmental groups believed that the suction dredge report did not address all of the required elements as set out in the 1996 settlement agreement.

To avoid further litigation over the general permits, EPA and the environmental groups entered into another settlement agreement. Pursuant to the agreement, EPA agreed that further study was necessary to quantify the full impact of suction dredge mining on the natural environment and that further research should be conducted before conclusions are reached about the impact of suction dredge mining on Alaska streams. EPA further agreed that by January 7, 1999, it would transmit to the Federal Register any necessary revisions to the modified general permits to address the results of the metals study. As a result, the environmental groups' petition to review the three general permits was dismissed on August 31, 1999.

III. INDUSTRY DESCRIPTION

Placer mining involves the mining and extraction of gold or other heavy metals and minerals primarily from alluvial deposits. These deposits may be in existing stream beds or ancient, often buried, stream deposits, i.e. paleo or fossil placers. Many Alaskan placer deposits consist of unconsolidated clay, sand, gravel, cobble and boulders that contain very small amounts of native gold or other precious metals. Most are stream deposits that occur along present stream valleys or on benches or terraces above existing streams. Beach placer deposits have been and continue to be important producers in Alaska. These deposits, most notable near Nome, include both submerged and elevated beach placer deposits.

Dredging systems are classified as hydraulic or mechanical (including bucket dredging), depending on the methods of digging. Suction dredges, the most common hydraulic dredging system, are quite popular in Alaska with the small and recreational gold placer miner. Like all floating dredges, suction dredges consist of a supporting hull with a mining control system, excavating and lifting mechanism, gold recovery circuits, and waste disposal system. All floating dredges are designed to work as a unit to dig, classify, beneficiate ores and dispose of waste. Because suction dredges work the stream bed rather than stream banks, the discharge from suction dredges consists totally of stream water and bed material.

In the modified 1994 permit, EPA defined a medium size suction dredges as those with nozzles greater than four and less than or equal to eight inches. EPA is proposing to redefine the medium-size suction dredge range as greater than four inches and less than or equal to ten inch dredges. Information provided in EPA's suction dredge study and the United States Geological Survey (USGS) study (see Appendix B for a summary of the studies) on an eight and a ten inch suction dredge support the conclusion that the potential short-term effects on water quality caused by this increased size are well within the limitations of the proposed permit. In addition, the provision in the proposed permit requiring permittees to halt or reduce activity if they are not in compliance with permit limits further ensures that beneficial uses will be protected.

III. RECEIVING WATER

The receiving waters are the waters of United States and the State of Alaska, most of which are classified in the Alaska Water Quality Standards (AWQS) [18 AAC 70] as Classes (1)(A), (B), (C), and (D) for use in drinking, culinary and food processing, agriculture, aquaculture, and industrial water supply; contact and secondary recreation; and growth and propagation of fish, shellfish, other aquatic life, and wildlife. Some of the receiving waters have been reclassified as industrial use only. These are Isabell Creek (upper), Lillian Creek, Lucille Creek, Olive Creek (upper), and Ruth Creek near Livengood and Nolan Creek and all its tributaries excluding Acme Creek near Wiseman.

This permit will be available for dischargers in reclassified waters. The AWQS contained in this permit are more stringent than would be applied in an individual permit in these locations. A facility located on any of the above receiving waters may apply for an individual permit under Section I.C.

Some of the receiving waters are marine waters that are classified in 18 AAC 70 as Classes (2)(A), (B), (C), and (D) for use in aquaculture, seafood processing, and industrial water supply; contact and secondary recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life.

IV. EFFLUENT LIMITATIONS, MONITORING & REPORTING REQUIREMENTS

In establishing permit limits, EPA first determines which technology-based limits must be incorporated into the permit. EPA then evaluates the effluent quality expected to result from these controls, to see if it could result in any exceedences of the water quality standards in the receiving water. If exceedences could occur, EPA must include water quality-based limits in the permit. The proposed permit limits will reflect whichever requirements (technology-based or water quality-based) are more stringent.

A. Technology-based Effluent Limitations

Pursuant to Section 402(a)(2) of the Act and 40 CFR 122.44(k)(2), Best Management Practices (BMPs) are being proposed in the permit.

Suction dredging's unique method of intake and displacement present unusual permitting issues. As discussed above, a suction dredge is a mechanical device that floats on the stream surface and pumps stream water and stream bed material through a suction intake conduit to a sluice box from which gold or other minerals may be recovered. The discharge from suction dredges consists totally of stream water and bed material immediately released back into the receiving water.

The BMPs in Permit Part II.C. are being proposed because technology-based numeric effluent limitations are infeasible.

B. Water quality-based Effluent Limitations

Section 301(b)(1) of the Act requires the establishment of limitations in permits necessary to meet water quality standards by July 1, 1977. All discharges to state waters must comply with state and local coastal management plans as well as with state water quality standards, including the state's antidegradation policy. Discharges to state waters must also comply with limitations imposed by the state as part of its coastal management program consistency determination and of its certification of NPDES permits under section 401 of the Act.

The NPDES regulations at 40 CFR 122.44(d)(1) require that permits include water quality-based limits that "Achieve water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

EPA has determined that turbidity is a pollutant of concern. Required turbidity monitoring is designed to ensure that the BMPs are being implemented properly.

1. *Freshwaters:*

The proposed permit requires a daily visual inspection for turbidity of the area within 500 feet downstream of the suction dredge during operation. This also includes any turbidity that may result from any other part of the operation. If turbidity is observed beyond 500 feet, the proposed permit requires the permittee to modify the operation to meet the permit limitation. If the operation cannot be modified to meet the limit, the operation is not authorized. In most cases, water quality recovers rapidly. The daily inspection during operation, combined with the BMPs in Permit Part II.C. will

assure that the water quality standards are met.

2. *Marine Waters*

The proposed permit requires a daily visual inspection for turbidity of the area within a 500 foot radius of the suction dredge during operation. This also includes any turbidity that may result from any other part of the operation. If turbidity is observed beyond 500 feet, the proposed permit requires the permittee to modify the operation to meet the permit limitation. If the operation cannot be modified to meet the limit, the operation is not authorized. In most cases, water quality recovers rapidly. The daily inspection during operation, combined with the BMPs in Permit Part II.C. will assure that the water quality standards are met.

3. *Mixing Zones*

It is expected that ADEC will certify these mixing zones as protective of Alaska Water Quality Standards (AWQS) under Section 401 of the CWA. If the 401 certification authorizes a different size mixing zone, the limits in the proposed permit will be changed as necessary to ensure that water quality standards are met at the edge of the mixing zone. If the certification does not authorize mixing zones for turbidity, the permit will be changed to require meeting the water quality standard for turbidity at the point of discharge.

C. Monitoring

Section 308 of the Clean Water Act and the federal regulations at 40 CFR § 122.44(i) require that permits include monitoring to determine compliance with effluent limitations. Monitoring may also be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results to EPA.

D. Reporting

The proposed permit requires permittees to submit an annual report by November 30th of each year, based on the reporting provisions in 40 CFR §122.48. 40 CFR 122.44(i)(2) allows flexibility in determining the frequency of reporting.

V. **BEST MANAGEMENT PRACTICES (BMPs)**

BMPs are measures that are intended to prevent or minimize the generation and the potential for the release of pollutants from industrial facilities to the waters of the United States through normal operations and ancillary activities.

Pursuant to Section 402(a)(1) of the Clean Water Act, development and implementation of BMP Plans may be included as a condition in NPDES permits. Section 402(a)(1) authorizes EPA to include miscellaneous requirements that are deemed necessary to carry out the provision of the Act in permits on a case-by-case basis. BMPs are required to control or abate the discharge of pollutants in accordance with 40 CFR § 122.44(k).

The proposed permit requires compliance with the following BMPs:

- A. Dredging that results in undercutting, littoral channeling, or otherwise results in stream bank or beach erosion, is prohibited.

This practice will ensure that erosion does not occur and that the finer sediments that may be found in these areas do not cause turbidity problems in the receiving waters.

- B. Winches or other motorized equipment shall not be used to move boulders, logs, or other natural obstructions.

This practice should ensure that important habitat which includes large organic debris and large boulders in these areas will not be destroyed.

- C. Suction dredges shall not operate within 800 feet of:

1. another dredging operation occurring simultaneously or,
2. a location where it is apparent that another operation has taken place.

This practice should ensure that the mixing zone of a facility does not overlap with that of another since 800 feet is the distance of a 500 foot mixing zone for each operation plus a designated 300 foot buffer before the next suction dredge would impact water quality.

- D. Dredging of concentrated silt and clay should be avoided. The permittee shall use reasonable care to avoid dredging silt and clay materials that would result in a significant increase in turbidity. Reasonable care includes moving the dredge to a new location or reducing the volume of effluent discharge by limiting operation speed of the suction dredge.

This practice will decrease the amount of fine material that will be released into the water that could cause turbidity plumes in excess of the permitted distance.

- E. Care shall be taken by the operator during refueling of equipment to prevent

spillage into surface waters or to groundwater.

This practice will decrease the potential for contamination of surface water by petroleum products.

VI. OTHER PERMIT CONDITIONS

Oil Spill Requirements

Section 311 of the Act prohibits the discharge of oil and hazardous materials in harmful quantities. The operator shall maintain fuel handling and storage facilities in a manner that will prevent the discharge of fuel oil into the receiving waters. A Spill Prevention Control and Countermeasure Plan (SPCC Plan) shall be prepared and updated as necessary in accordance with provisions of 40 CFR Part 112 for facilities with the capacity to store 660 gallons in a single container above ground, 1320 gallons in the aggregate above ground, or 42,000 gallons below ground.

The Permittee shall indicate in the AR if an SPCC Plan is necessary and in place at the site and if changes were made to the Plan over the previous year.

Endangered Species Act

The Endangered Species Act (ESA) requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. EPA sent a letter to the U.S. Fish and Wildlife Service and to the National Marine Fisheries Service on November 10, 1999, requesting a species list for the coverage area of the general permit. If necessary, EPA will enter into informal or formal consultation with USFWS and NMFS to ensure that the general permit will not result in unacceptable impacts to any of the species identified on these lists.

Essential Fish Habitat (EFH)

The 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act set forth a number of new mandates for NMFS, regional fishery management councils and other federal agencies to identify and protect important marine and anadromous fish habitat. The action agency needs to make a determination Federal actions that may adversely impact EFH.

In streams where suction dredging occurs, the most critical life stage for salmon is the egg stage. The GP prohibits suction dredging within 500 feet of locations where fish are spawning or where fish eggs or alevins are known to exist. The Alaska Department of Fish and Games issues permits for mining in anadromous streams that limit or prohibit mining while the eggs are in the gravel. In freshwaters, the GP is unlikely to be used during the critical phase and if it were, The studies showed that the impacts of an operation are minimal after 500 feet so

the 500 foot buffer should be sufficient protection. EPA has determined that no adverse impact to EFH in freshwaters would result from the issuance of this permit.

Most marine waters surrounding the state of Alaska have been designated as essential fish habitat. In a general permit, it is not possible to determine where facilities might be located during the life of the permit so it is also not possible to determine the potential impact on EFH. This can be only be done on a project by project basis. Since each Suction Dredge in marine waters requires a Section 10 permit from the Army Corps of Engineers and these federal permits require an individual EFH determination, EPA will defer to the Corps determination on these facilities.

State Certification

Section 401 of the Clean Water Act requires EPA to seek certification from the State that the permit is adequate to meet State water quality standards before issuing a final permit. The regulations allow for the State to stipulate more stringent conditions in the permit, if the certification cites the Clean Water Act or State law references upon which that condition is based. In addition, the regulations require a certification to include statements of the extent to which each condition of the permit can be made less stringent without violating the requirements of State law.

The draft permit has been sent to the State to begin the final certification process. If the state authorizes different or additional conditions as part of the certification, the permit may be changed to reflect these conditions.

Consistency Determination

EPA has sent a copy of the permit to the State of Alaska, Office of Management and Budget, Division of Governmental Coordination (DGC), which will review this permitting action for consistency with the approved Alaska Coastal Management Program (ACMP). For more information concerning this review, please contact Mr. Rex Blazer at (907) 465-8791.

Permit Expiration

This permit will expire five years from the effective date of the permit.

APPENDIX A -- LIST OF ACRONYMS

AAC	Alaska Administrative Code
ACMP	Alaska Coastal Management Program
ADEC	Alaska Department of Environmental Conservation
AR	Annual Report
AWQS	Alaska Water Quality Standard
BMP	Best Management Practices
CFR	Code of Federal Regulations
CSU	Conservation System Unit
CWA	Clean Water Act
DGC	Division of Governmental Coordination
EFH	Essential Fish Habitat
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FR	Federal Register
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
SPCC	Spill Prevention Control and Countermeasure
USFWS	United States Fish & Wildlife Service
USGS	United States Geological Survey

APPENDIX B -- SUMMARY OF SUCTION DREDGE STUDY

EPA commissioned a suction dredge study that was conducted on the Fortymile River in 1997 and 1998 by Idaho State University. Two sites were chosen, Site 1 was in the vicinity of a 10 inch suction dredge while Site 2 was in the vicinity of an 8 inch suction dredge. USGS also conducted studies in the same area.

The primary effect of dredging on water chemistry was increased turbidity, total filterable solids, and copper and zinc concentrations downstream of the dredge.

The turbidity plume was visually dramatic at Site 1 but spatially confined to less than 525 feet. At 100 feet downstream, the turbidity values were reported at 19 NTU which, with background levels reported at 2.2 - 2.3 NTU, would exceed the AWQS of 5 NTU above background. But at 200 feet below the dredge, the turbidity values were 3.7 NTU which is only 1.4 - 1.5 NTUs above background which is well within the AWQS and the permit limits. The USGS report states that the turbidity values for Site 2 were less than Site 1. In their study, USGS attributes higher turbidity for Site 1 to increased volume of the larger dredge and the finer material being mined. It should be noted that even with these adverse conditions, the ten inch dredge was well within compliance with the discharge requirements of their NPDES permit.

As the sediments were transported downstream, the total copper and zinc concentrations declined. By 262 feet downstream of the dredge, copper and zinc concentrations were similar to those measured upstream of the dredge.

In general, the observed decrease in water clarity was unlikely to have altered ecosystem function in the area of the Fortymile where the dredge was located. There also did not appear to be any downstream influence on bed morphology by dredged sediments, indicating that dredging strongly influenced immediately adjacent substrates but had little effect beyond the dredged area. Based on observations made in both studies it appears that the dredge piles at the examined locations will remain in place no longer than 1 to 3 years and in many cases the stream channel will return to its pre-dredge condition in a year.

As with water clarity, the effect of suction dredging on macroinvertebrate abundance and diversity was confined spatially to a relatively small area downstream of the dredge. Both abundance and diversity were notably reduced for 33 feet downstream of Site 1 with similar occurrence at Site 2. By 262 feet, both appeared to be unaffected by the dredge plume. The results from 1998 indicate that substantial recovery of the macroinvertebrate community occurs within one year after suction dredging. The effects of suction dredge mining on macroinvertebrates are local and short lived.

APPENDIX C -- REFERENCES

NPDES Permit Writer's Manual. EPA, Office of Water, Office of Wastewater Management, Permits Division. Washington, DC. 20460; EPA-833-B-96-003, December 1996, 220pp.

Technical Support Document for Water Quality-based Toxics Control. EPA, Office of Water Enforcement and Permits, Office of Water Regulations and Standards. Washington, DC, 20460; EPA/505/2-90-001, March 1991, 145pp.

Impact of suction dredging on water quality, benthic habitat, and biota in the Fortymile River, Resurrection Creek, and Chatanika River, Alaska. Prepared for EPA by Aaron M. Prussian, Todd V. Royer, and G. Wayne Minshall, Idaho State University. June 1999.

Regional Baseline Geochemistry and Environmental Effects of Gold Placer Mining Operations on the Fortymile River, Eastern Alaska. Department of Interior, U.S. Geological Survey. Open-File Report 99-328. 1999.

Regional Geochemical Results from the Analyses of Rock, Water, Soil, Stream Sediment, and Vegetation Samples--Fortymile River Watershed, East-Central Alaska. Department of Interior, U.S. Geological Survey. Open-File Report 99-33. 1999.